

# The importance of food supplements for public health and wellbeing.

Bernd Haber, BASF SE

3<sup>rd</sup> GTBD Conference on Food and  
Nutrition Policies, Ankara 4./5.12.2019



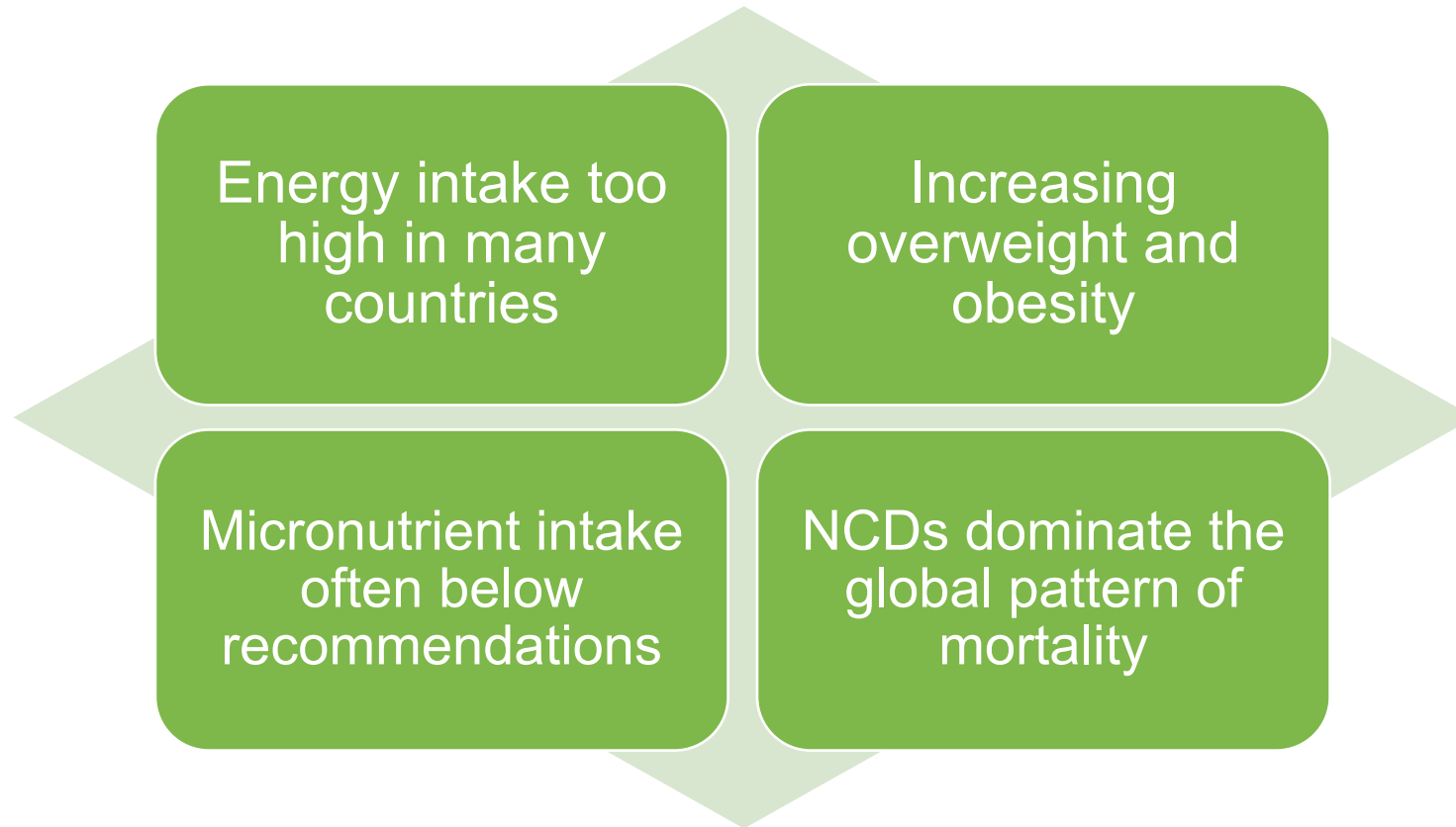
# Agenda

- 1.** Global health situation
- 2.** Recommendations and needs – example: Vitamin D
- 3.** Health Care Cost Savings – Can supplements play a role?

# Agenda

- 1. Global health situation**
- 2. Recommendations and needs – example: Vitamin D**
- 3. Health Care Cost Savings – Can supplements play a role?**

# Healthy nutrition for all – but what is reality?



# Concerns driven by malnutrition or unhealthy nutrition affect all societies

## OBESITY AND OVERWEIGHT

Share of overweight (BMI >25) population aged 20+

67%



USA

34%

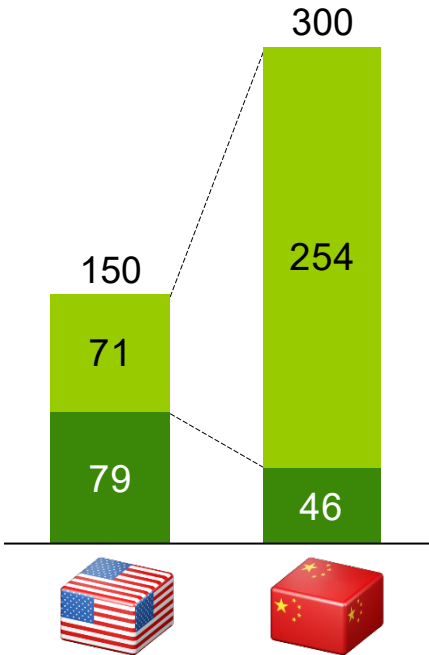


China

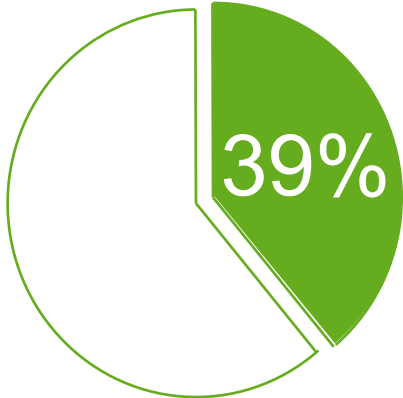


# of people aged 20+ by country (million)

Overweight (BMI >25)  
Obese (BMI >30)



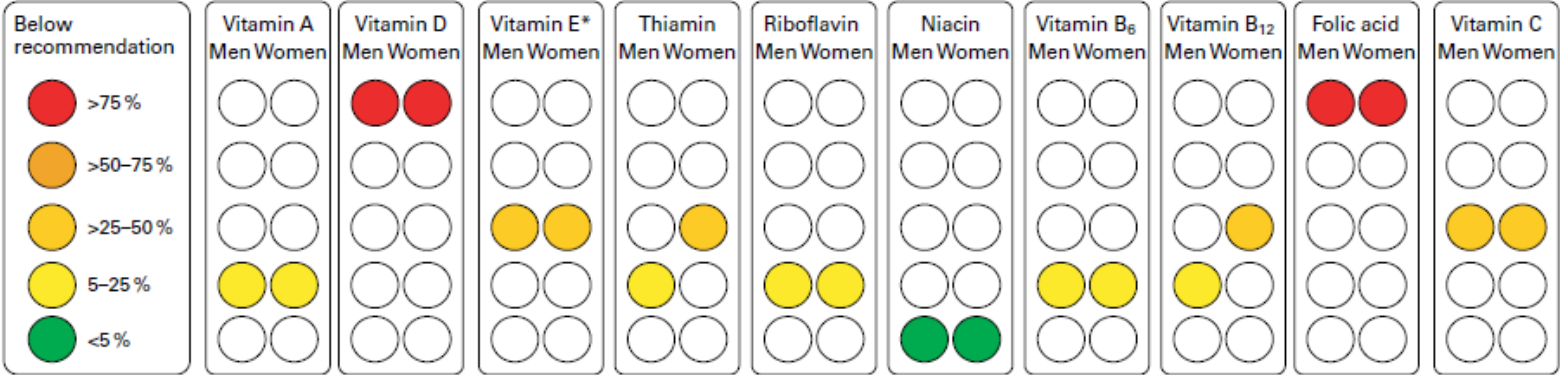
Adults aged 18+ who were overweight in 2014:



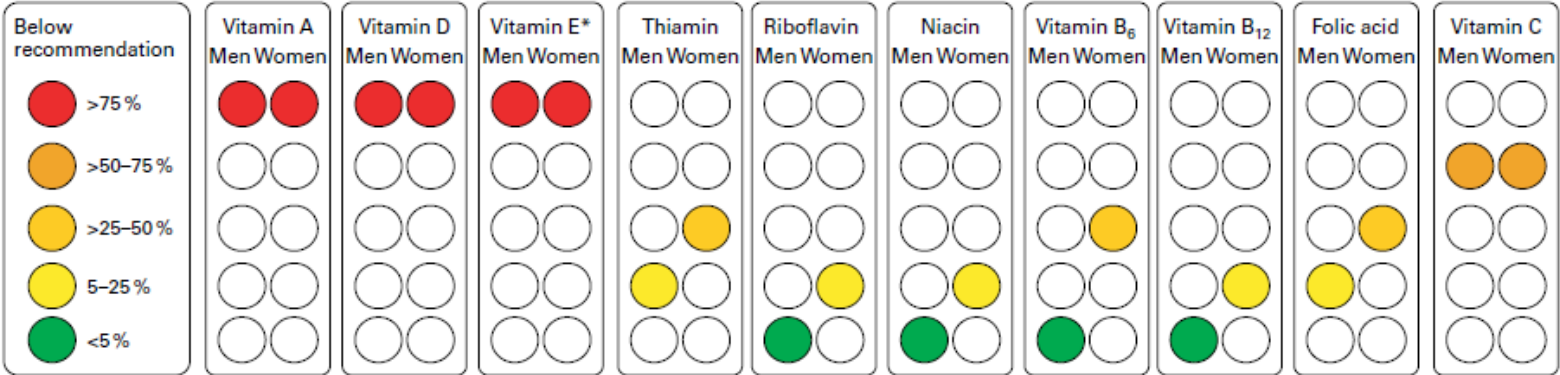
These are **1.9bn** people  
**62%** of obese people live in developing countries

# Micronutrient deficiency or insufficiency is not only a problem of developing countries.

Germany

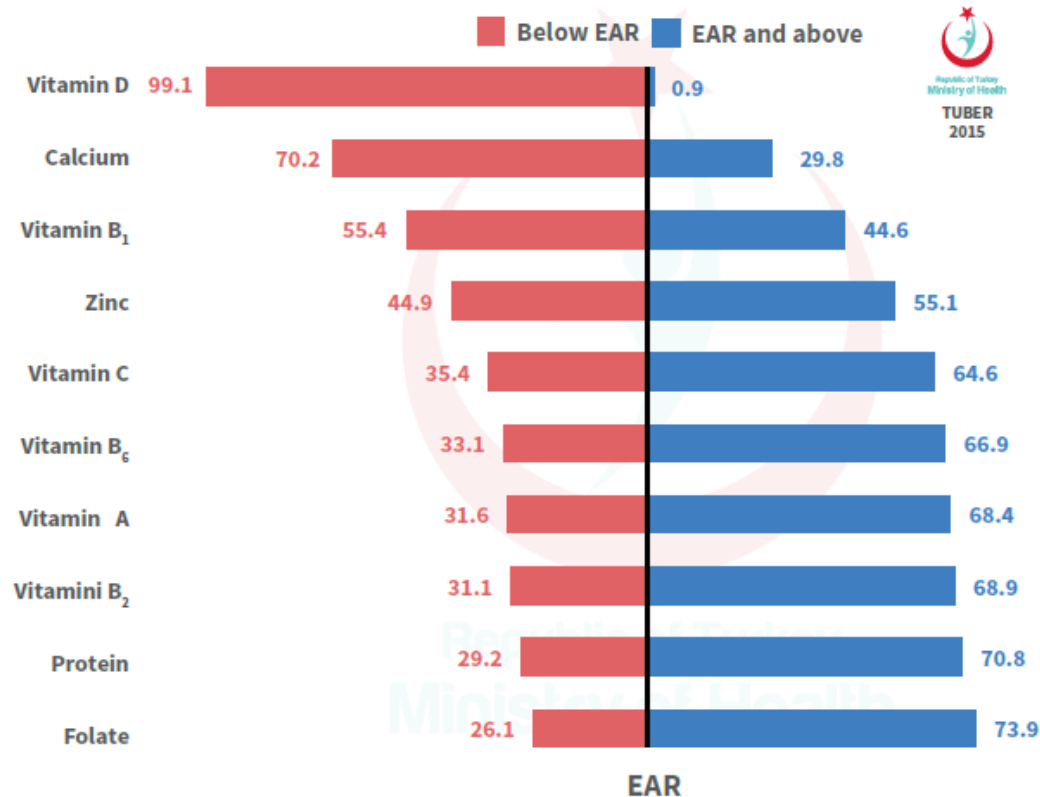


USA



[Troesch et al, BJN, 2012]

# Also in Turkey larger parts of the population have too low nutrient intakes from the diet.



Source: Turkey Nutrition and Health Survey 2010  
Ministry of Health of Republic of Turkey / Hacettepe University, February 2014

<sup>1</sup> Estimated Average Requirements (EAR/AR); for explanations see Chapter 10: Table 10.1.

Appendix 4.1.1. Percentage of individuals with Nutrient Intakes below and equal or above the Estimated Average Requirements (EAR/AR) (%)

„Vitamin D is the nutrient with the largest consumption deficit in all age groups across Turkey.”

# Non-communicable diseases (NCDs) cause more deaths than all other causes combined

- Four major NCDs, cardiovascular diseases, cancer diseases, chronic respiratory diseases and diabetes, are responsible for 70% of all deaths worldwide (82% of NCD deaths).
- Modifiable risk factors of NCDs:
  - ▶ tobacco use,
  - ▶ unhealthy diet,
  - ▶ lack of physical activity,
  - ▶ harmful use of alcohol

## CHINA

<b>1 405 000 000</b>	<b>89%</b>	<b>8 792 000</b>	<b>18%</b>
Total population	Percentage of deaths from NCDs	Total number of NCD deaths	Risk of premature death from target NCDs

## GERMANY

<b>81 708 000</b>	<b>91%</b>	<b>800 000</b>	<b>12%</b>
Total population	Percentage of deaths from NCDs	Total number of NCD deaths	Risk of premature death from target NCDs

## TURKEY

<b>78 271 000</b>	<b>88%</b>	<b>392 000</b>	<b>17%</b>
Total population	Percentage of deaths from NCDs	Total number of NCD deaths	Risk of premature death from target NCDs

## UNITED STATES OF AMERICA

<b>320 000 000</b>	<b>88%</b>	<b>2 343 000</b>	<b>14%</b>
Total population	Percentage of deaths from NCDs	Total number of NCD deaths	Risk of premature death from target NCDs

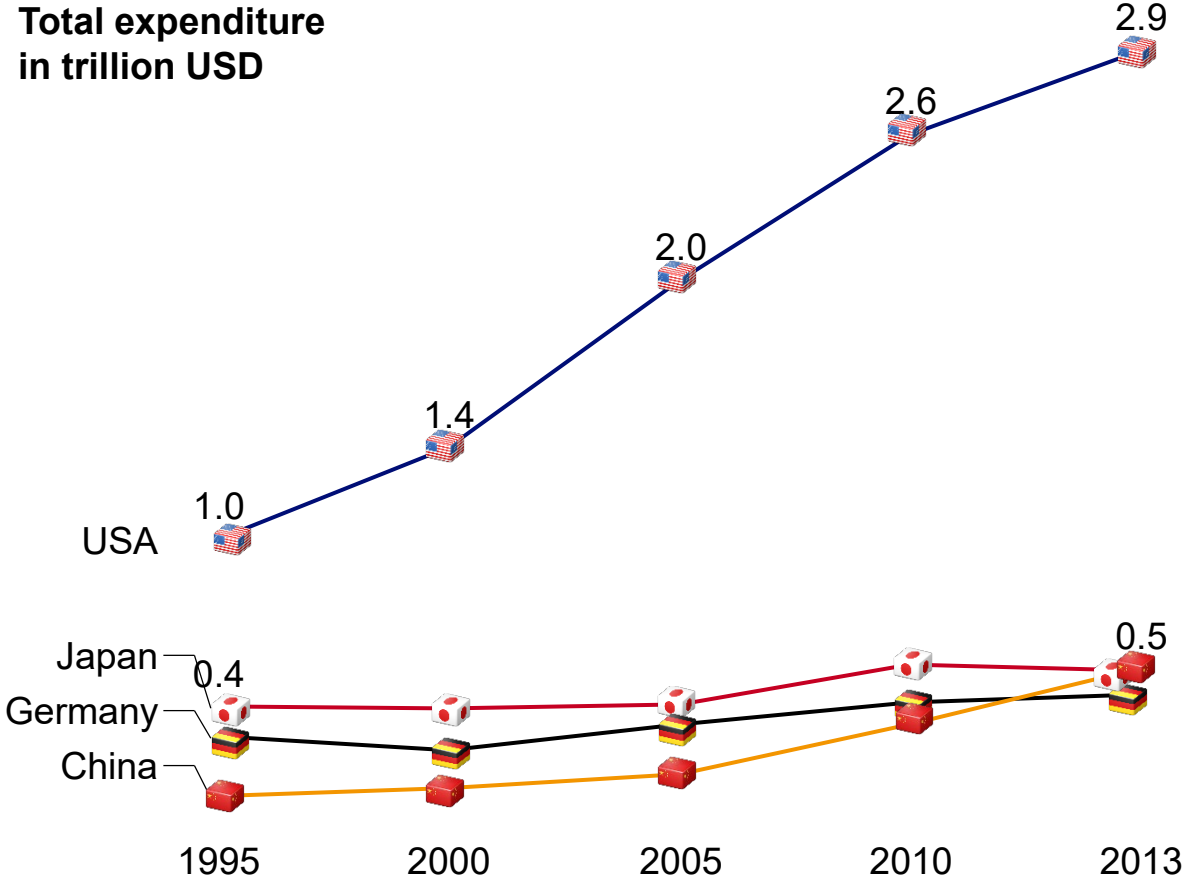
[WHO 2017 – NCD Progress Monitor]



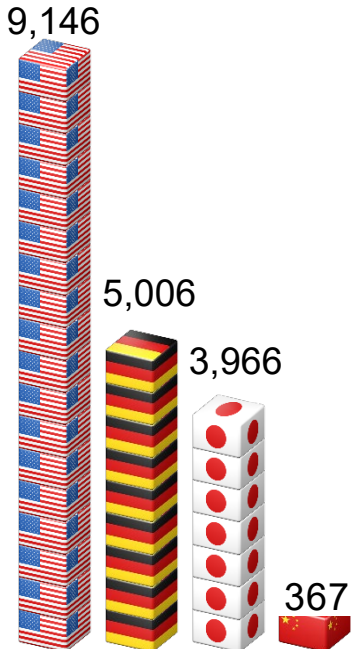
# Preventing NCDs before treatment makes sense as global health costs explode

## EXPENDITURE ON HEALTH

Total expenditure in trillion USD



2013 per capita expenditure in USD



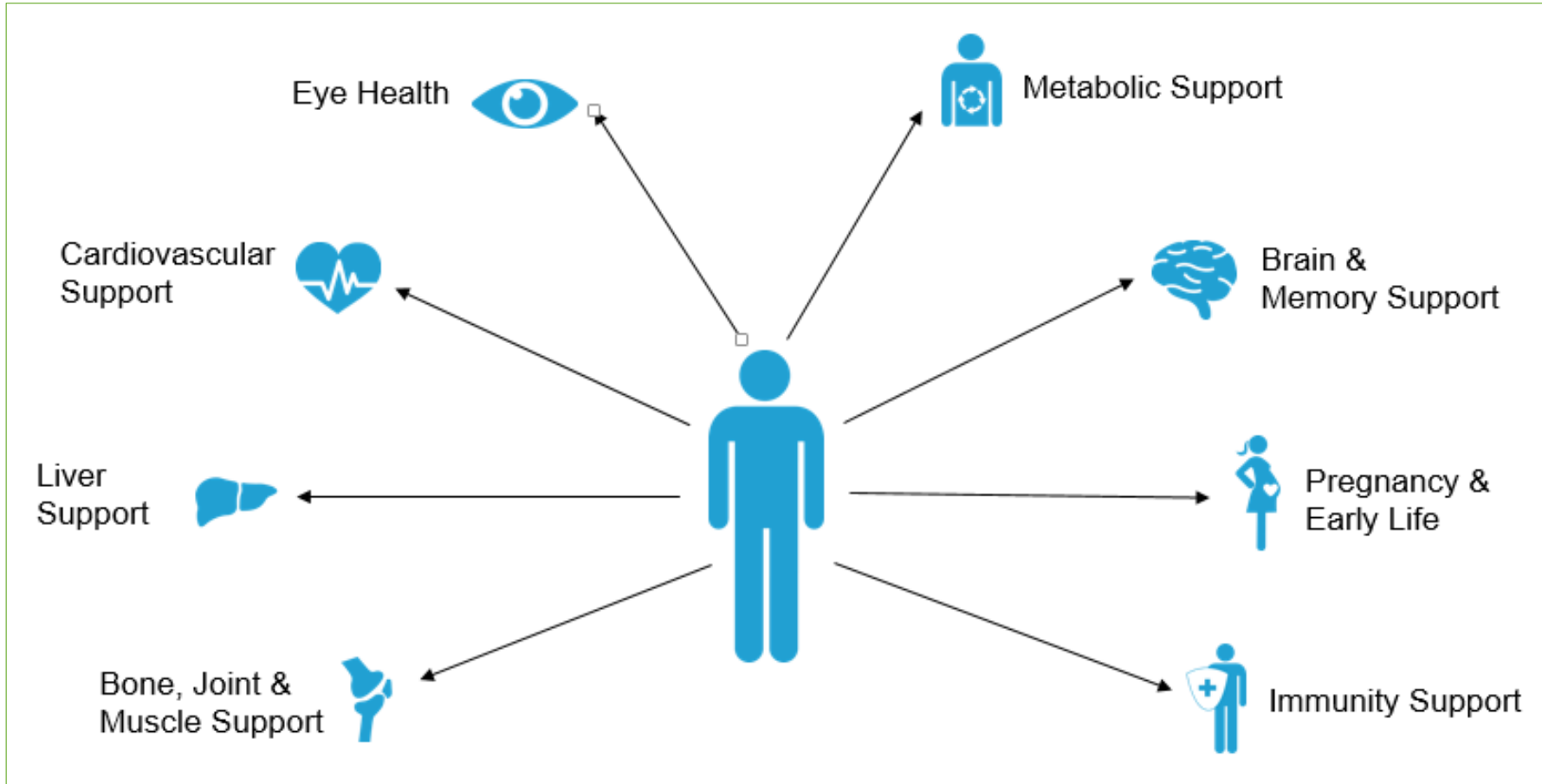
Health promotion and disease prevention have to be a central part of any national and international health policy!



# Agenda

1. Global health situation
- 2. Recommendations and needs – ex. Vitamin D**
3. Health Care Cost Savings – Can supplements play a role?

# Vitamin D has multiple health benefits – bone health is extensively studied



**1** out of **3** women and **1** out of **5** men suffer from osteoporotic fracture.

Every **3** seconds a bone breaks due to osteoporosis worldwide.

**125** million people suffer from osteoporosis in Europe, India, Japan and the USA.

# Dietary recommendations vs. recommendations on vitamin D blood levels.

**German Nutrition Society (DGE):**  
 serum 25-hydroxyvitamin D concentrations of **50 nmol/l (20 ng/mL)** or higher are considered an indicator of an optimal vitamin D status.

**International Osteoporosis Foundation (IOF):**  
 "... there is emerging evidence and expert opinion that the minimum blood level of 25(OH)D that would be optimal for fracture prevention is **70-80 nmol/l (28-32 ng/mL)**"

Country / Organisation	Vitamin D / day
Germany Recommended Intake (when endogenous synthesis is missing)	10 µg (400 IU) (m/f, below 1 yr.) 20 µg (800 IU) (m/f, all ages from 1 yr.)
Germany Intake from diet Adults in Germany (NVS II, 2008)	2,9 µg (m) 2,2 µg (f)
Turkey: Adequate Intake	15 µg (m/f, 2-70 yrs.) 20 µg (m/f, ≥70 yrs.)
IOF: Recommended Intake	min. 20-25 µg (800-1000 IU)

# Vitamin D – is sunshine the solution?

The most effective way of preventing vitamin D deficiency at all ages is exposure to sunshine in a regular and conscious way.



People from north regions

People who stays indoors

People over 70ties

People with dark skin

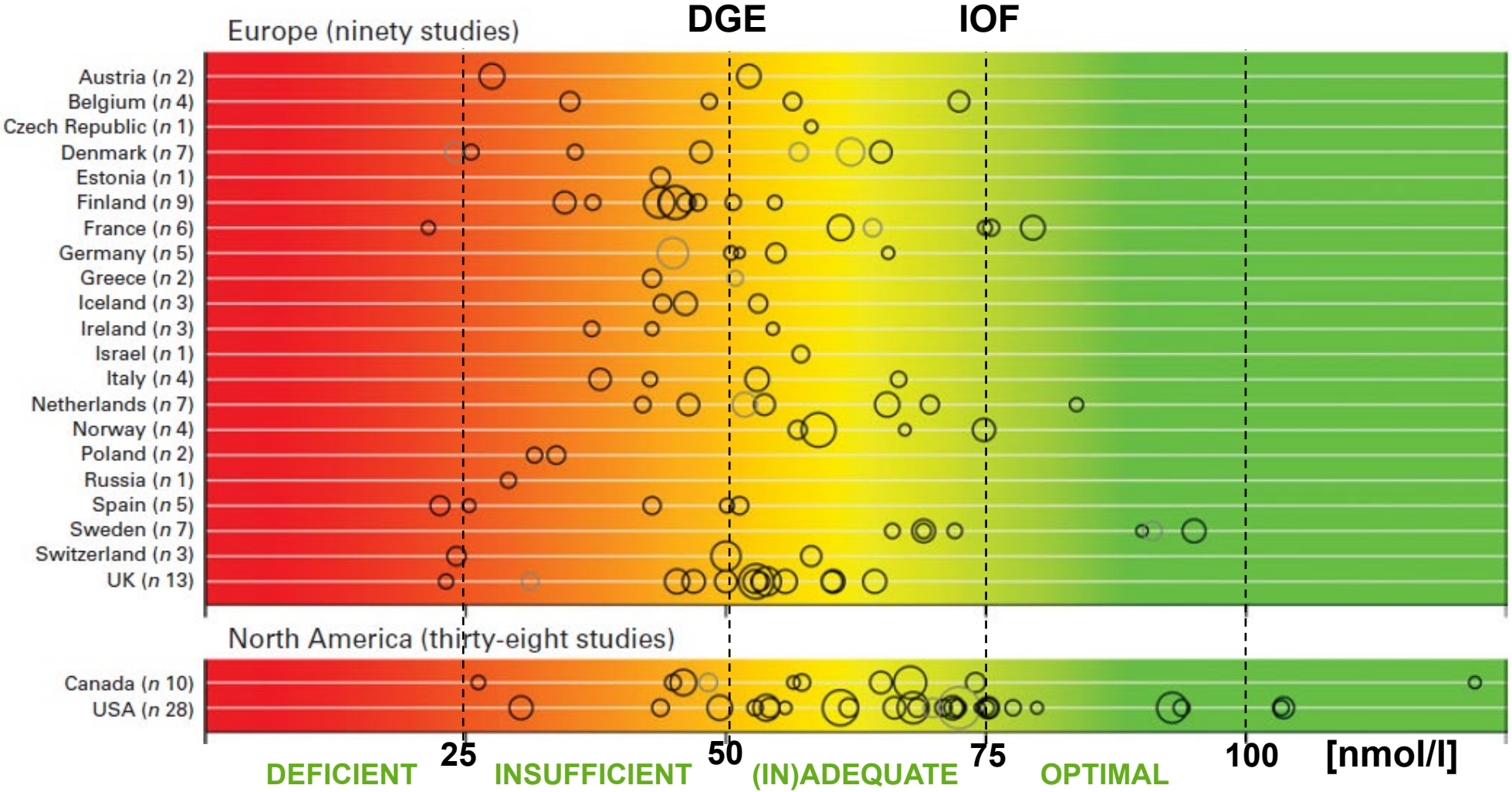
People dressed in traditional clothing style

Obese people

Time from November to March

Air pollution, foggy weather, sun protection, sunglasses

# Prevalence of low vitamin D status is globally high.



88.1% < 75 nmol/l  
 37.3% < 50 nmol/l  
 6.7% < 25 nmol/l

[Hilger et al., BJN, 2014]



# Approx. 75% of Turkish population suffer from low vitamin D levels.

**Table 5** Prevalence of low vitamin D status in selected European countries

Country, source	n	Age (range or mean)	<25 nmol/l (<10 ng/ml)	<45/50 nmol/l (<20 ng/ml)
Austria (Austrian Nutrition Report 2012)	1002	7–14 F	22.3	40.0
		7–14 M	17.7	38.1
		18–64 F	11.6	28.2
		18–64 M	14.2	29.7
		65–80 F	19.9	42.4
		65–80 M	20.4	44.4
France (ENNS 2006–7)	2007	18–28	7.5	45.9
		30–54	5.2	41.4
		55–74	1.9	41.7
Germany (Hintzpeter <i>et al.</i> 2008a)	4030	18–79 M	15.6	56.8
		18–79 F	17.0	57.8
The Netherlands (van der A D <i>et al.</i> 2012)	2785	18+ M	10 (<30 nmol/l)	39
		18+ F	8 (<30 nmol/l)	34
Spain (González-Molero <i>et al.</i> 2011)	1262	20–83		33.9
Turkey (Hekimsoy <i>et al.</i> 2010)	391	45.1		74.9
Northern Europe* (Andersen <i>et al.</i> 2005)	420	12.6	37	92
		71.8	17	67

\*Northern Europe: Denmark, Finland, Ireland and Poland.

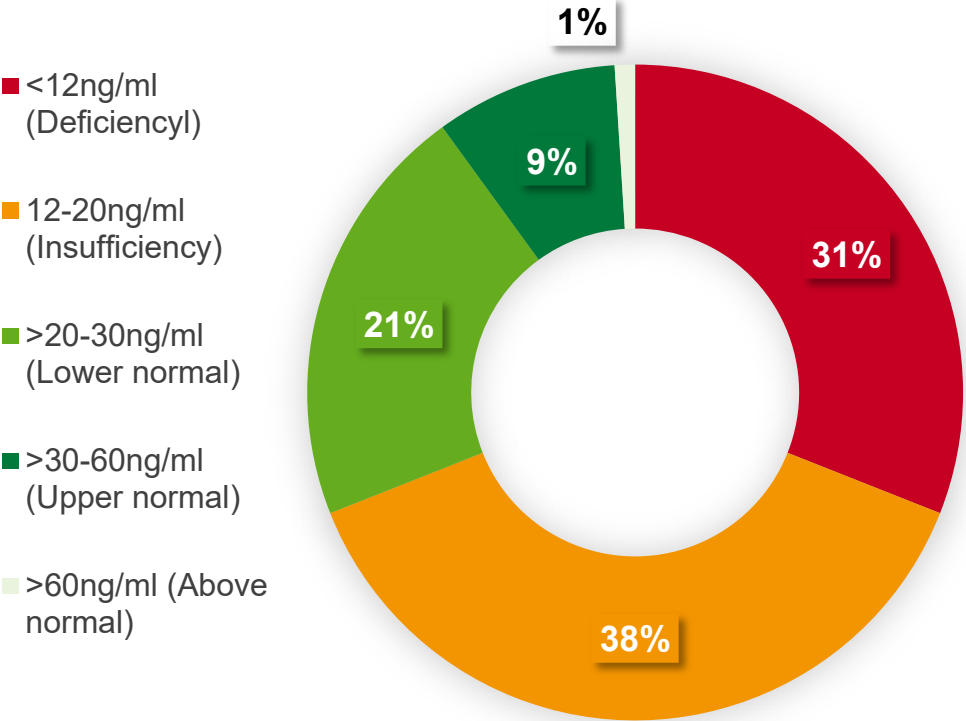
F, female; M, male.

Ref.: A. Spiro and J. L. Buttriss, 2014, British Nutrition Foundation *Nutrition Bulletin*, **39**, 322–350

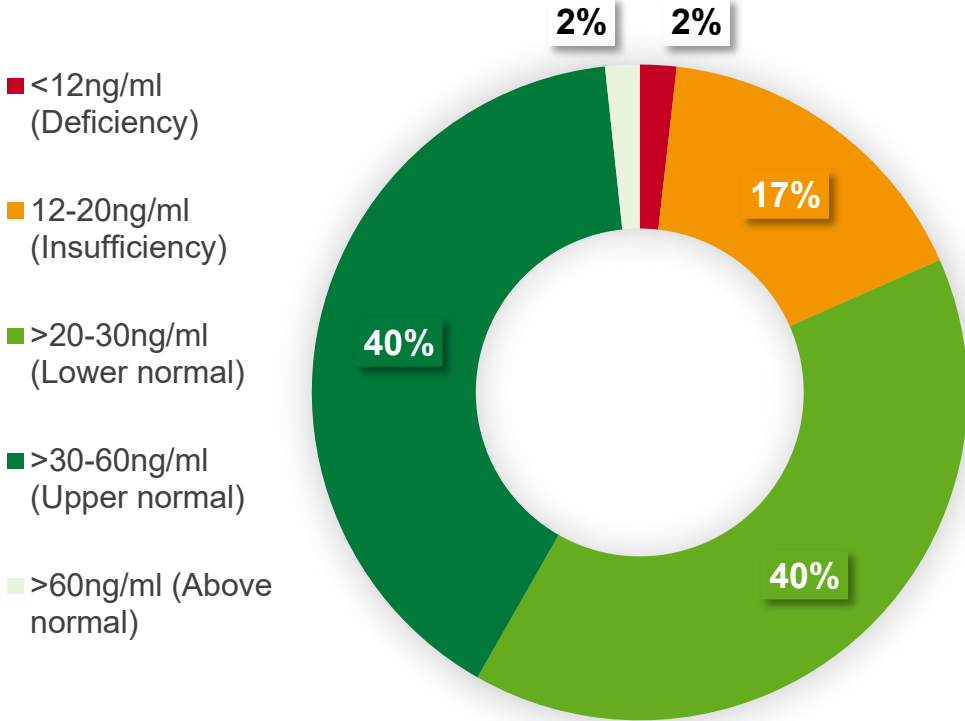


# Approx. 70% and 20% of BASF employees have deficient or insufficient vitamin D status after the winter and summer season, respectively.

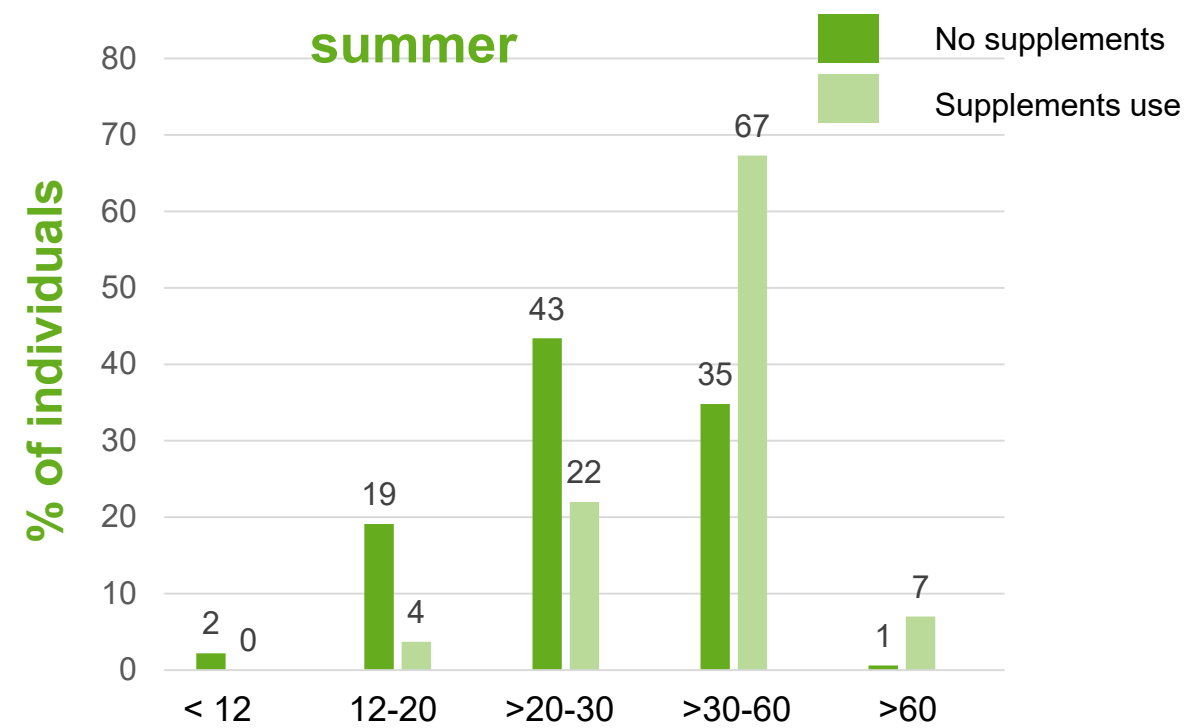
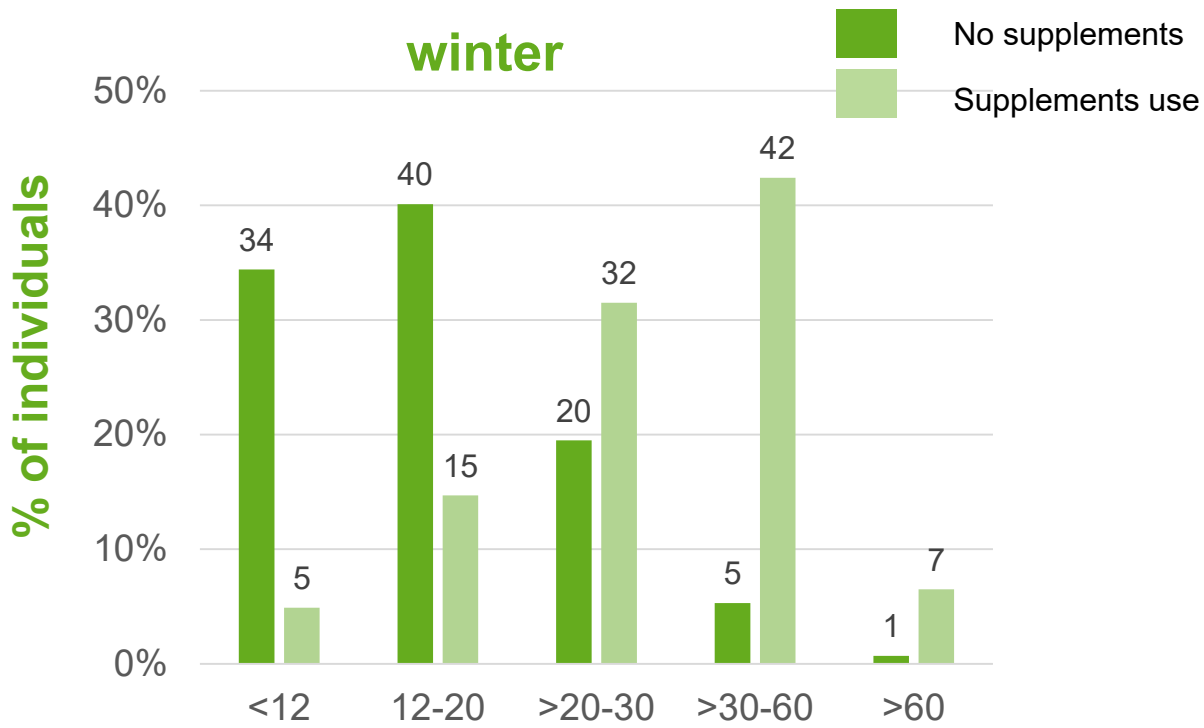
25(OH)D concentration in serum (winter levels)



25(OH)D concentration in serum (summer levels)



# Vitamin D3 supplementation significantly improved the vitamin D3 status after winter and further optimized it after summer season.



25(OH)-D-concentration in serum (ng/ml)

# Mind the Gap! Learn from Finland's fortification/supplementation program.



So, in 2003, the government introduced mandatory fortification of milk and margarine spreads.

But analysis of the results indicated that this programme did not go far enough.

In 2010, after consulting with scientists, the authorities increased the level of fortification and recommended vitamin D supplementation for children, adolescents and the elderly.

**The impact was huge.**

<https://www.iadsa.org/mind-the-gap>

<https://www.iadsa.org/mind-the-gap/english/finland#intro>

In 2000, before the fortification programme began, only one third of the Finnish population had an adequate vitamin D status.<sup>3</sup>

**BY 2011, THE FIGURE  
WAS 90%**

**But that's not all...**

When scientists analysed the vitamin D status of Finnish people after the second fortification programme in 2010, they found the average was **75.9 nmol/litre**.

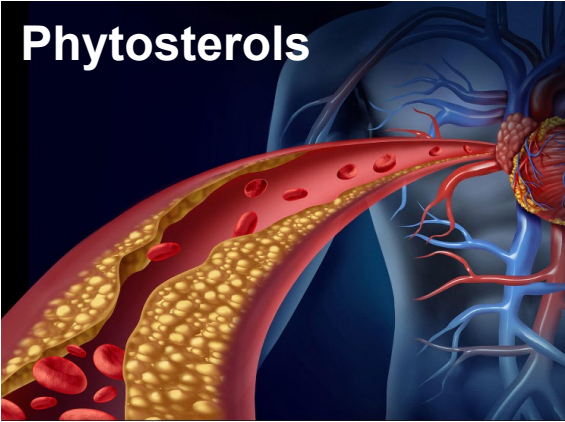
This is important because many scientists now agree that a vitamin D status of 75 nmol/litre (30 ng/ml) and above is optimal.

# Agenda


1. Global health situation
2. Recommendations and needs – ex. Vitamin D
- 3. Health Care Cost Savings –  
Can supplements play a role?**

# Can supplements play a role to reduce health care cost spendings?

Food Supplements Europe commissioned Frost & Sullivan to investigate if daily supplementation of the diet with specific food compounds would be able to reduce disease risk in adults over 55+ and result in healthcare costs savings.




# Can Calcium and Vitamin D reduce the burden of osteoporosis-attributed bone fractures in the EU?



**FROST & SULLIVAN**

**Healthcare Cost Savings of Calcium and Vitamin D Food Supplements in the European Union**

Exploring the Burden of Osteoporosis-attributed Bone Fractures in the European Union and the Benefits of Calcium + Vitamin D Food Supplements



An Independent Economic Analysis  
Commissioned by Food Supplements Europe

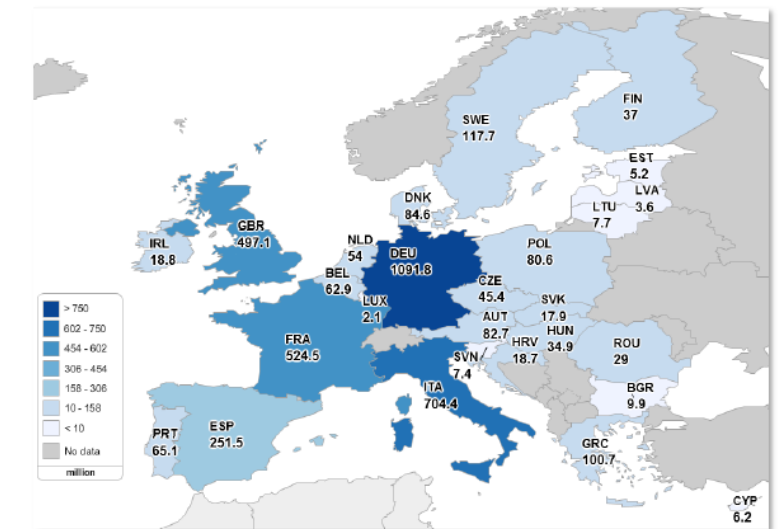
January 2017

www.frost.com

**Table 1**  
The Burden of Osteoporosis: Population Descriptive Statistics and Event Risk, Annualised Average, 2016-2020

Country	Total Population, Adults age 55 and older <sup>1</sup>	Population with Osteoporosis, Adults age 55 and older <sup>2</sup>	Percent of Population with Osteoporosis	Total Osteoporosis-attributed Fractures per Year <sup>3</sup>	Risk of Fracture among Target Population
Austria	2,574,872	458,547	17.8%	31,975	7.0%
Belgium	3,378,041	597,570	17.7%	29,613	5.0%
Bulgaria	2,395,715	417,907	17.4%	18,919	4.5%
Croatia	1,366,757	257,044	18.8%	13,020	5.1%
Cyprus	217,517	40,295	18.5%	2,183	5.4%
Czech Republic	3,224,578	529,058	16.4%	30,567	5.8%
Denmark	1,705,383	283,368	16.6%	24,270	8.6%
Estonia	408,180	77,431	19.0%	4,281	5.5%
Finland	1,801,776	304,453	16.9%	13,267	4.4%
France	20,023,397	3,475,310	17.4%	132,128	3.8%
Germany	27,840,013	5,023,912	18.0%	212,845	4.2%
Greece	3,544,810	642,707	18.1%	27,128	4.2%
Hungary	3,107,068	547,107	17.6%	28,656	5.2%
Ireland	1,051,651	166,436	15.8%	13,337	8.0%
Italy	20,248,958	3,792,031	18.7%	149,889	4.0%
Latvia	630,755	130,446	20.7%	5,713	4.4%
Lithuania	900,267	175,511	19.5%	8,343	4.8%
Luxembourg	139,939	21,963	15.7%	1,302	5.9%
Malta	134,864	20,264	15.0%	1,120	5.5%
Netherlands	5,078,117	818,502	16.1%	30,967	3.8%
Portugal	3,233,995	593,620	17.6%	17,230	2.9%
Poland	11,381,429	1,848,528	16.6%	67,062	3.6%
Romania	5,966,193	1,033,950	17.3%	61,436	5.9%
Slovakia	1,455,578	231,637	15.9%	18,197	7.9%
Slovenia	647,904	110,032	17.0%	6,228	5.7%
Spain	13,719,534	2,449,355	17.9%	76,844	3.1%
Sweden	2,992,914	523,095	17.5%	37,725	7.2%
United Kingdom	18,426,690	3,206,755	17.4%	180,355	5.6%
<b>Total EU</b>	<b>157,596,895</b>	<b>27,776,834</b>	<b>17.6%</b>	<b>1,244,600</b>	<b>4.5%</b>

**Chart 2**  
Calcium and Vitamin D Summary Economic Results, Total Benefit ((S) Potential Health Care Cost Savings), € million, Annualised Average, EU, 2016-2020  
Total EU: €3.96 billion



published February 2017



**BASF**  
We create chemistry



27.8 million

17.6%  
of people aged 55 +  
in the EU living  
with osteoporosis

Cost of treating bone fractures with wider use of  
Calcium + vitamin D supplements



cost of  
treating these fractures

€26.4bn/year

€21,231 / event

1.24m  
related fractures  
occurring  
every year

Cost of treating bone fractures with wider use of  
Calcium + vitamin D supplements



## Calcium plus vitamin D supplementation and risk of fractures: an updated meta-analysis from the National Osteoporosis Foundation

C. M. Weaver<sup>1</sup> • D. D. Alexander<sup>2</sup> • C. J. Boushey<sup>3</sup> • B. Dawson-Hughes<sup>4</sup> •  
J. M. Lappe<sup>5,6</sup> • M. S. LeBoff<sup>7</sup> • S. Liu<sup>8</sup> • A. C. Looker<sup>9</sup> • T. C. Wallace<sup>10,11</sup> • D. D. Wang<sup>12</sup>



Reduction of risk of  
osteoporosis-attributed fractures  
by regular consumption of  
1000 mg Calcium + 15 mcg Vitamin D



Cost of treating bone fractures with wider use of  
Calcium + vitamin D supplements

19.8  
billion

Total savings generated in  
the EU over 5 years through regular use of  
Calcium + Vitamin D supplements  
(equivalent to € 3.96 bn per annum)



186,690

osteoporosis-attributed bone fractures  
preventable every year

€3.47  
return for every  
€ 1  
spent on  
calcium + vitamin D  
supplements

Cost of treating bone fractures with wider use of  
Calcium + vitamin D supplements

# Supplementation of the diet with nutrients and food compounds can lead to significant reductions of hospital events and thus healthcare costs.



Omega-3



Phytosterols



Ca/Vit. D

	Relative risk reduction	Number of preventable events (over 5 years)	Healthcare costs savings (over 5 years)	Return for every € 1 spent
Omega-3	- 4.9 %	1.5 Mn	€ 64.5 Bn	€ 2.29
Phytosterols	- 2.3 %	0.85 Mn	€ 26.5 Bn	€ 4.37
Ca/Vit. D	- 15 %	0.93 Mn	€ 19.8 Bn	€ 3.47

More information under: [www.foodsupplementseurope.org](http://www.foodsupplementseurope.org)

# Conclusion

- A rethink of our understanding of health is needed. Health promotion should be in the center of policy activities.
- Food supplements can play an important role to close nutritional gaps and meet individual needs.
- Diagnosis of the individual nutritional needs and regular measurement about the effect of supplementation are important steps to improve the nutritional status of people and improve their overall health.
- Health care costs are steadily increasing. Food supplements can help to reduce health care costs and thus should be considered as one measure in policy making.

# Special Thanks



Patrick Coppens



Ute Obermüller-Jevic  
Marianne Heer  
Mareike Kampmann



We create chemistry